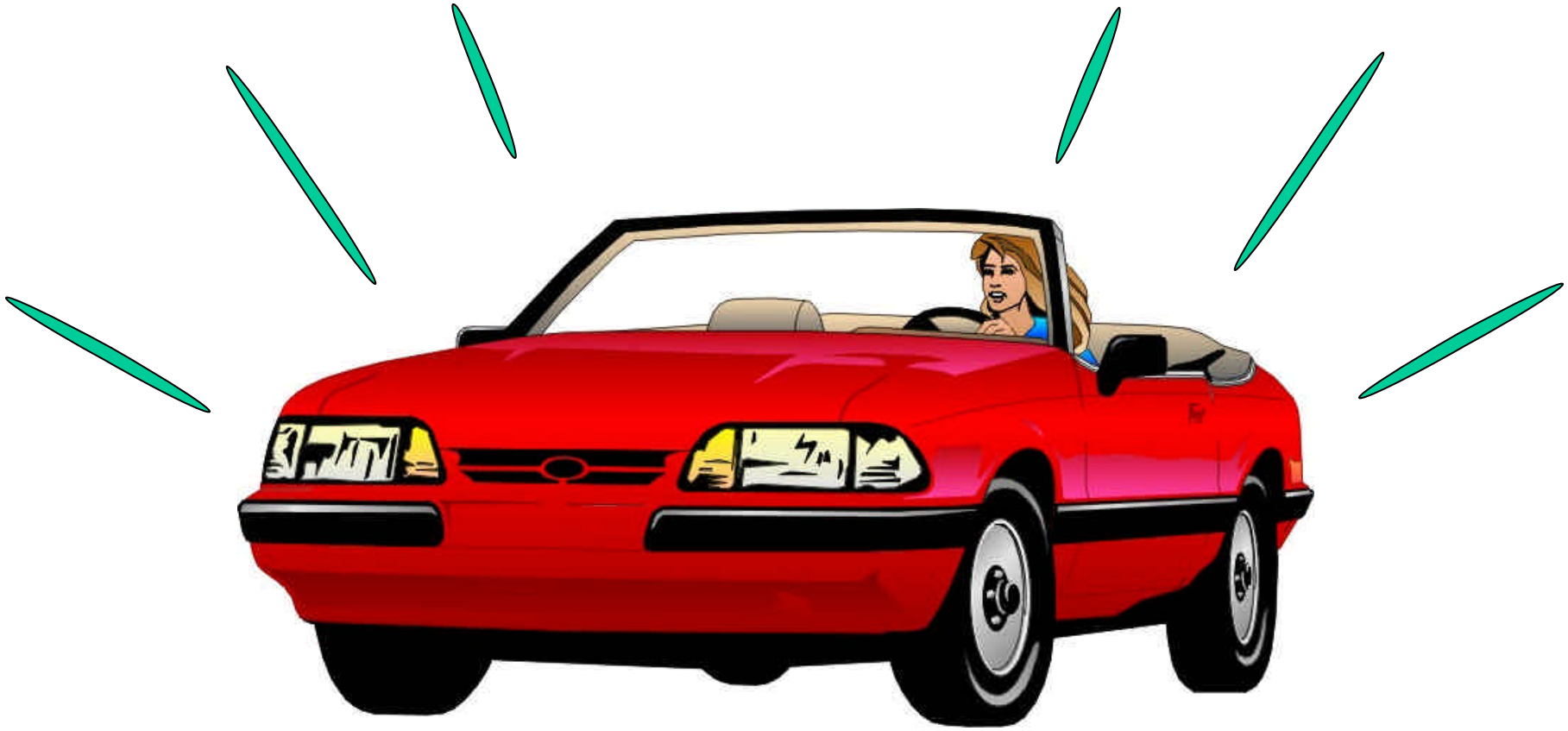
SIEMENS VDO
Automotive

Environmental Product Management



SIEMENS VDO
Automotive

Environmental Product Management

Sam Seabright:

- Manager, Technical Safety and Environment for North/South America
- Office is at Auburn Hills; Phone 248-209-3866
- Environmental, Health and Safety Compliance Officer for Siemens VDO Automotive Corporation
- Environmental, Health and Safety audits, inspections, reports, new acquisitions, construction, training and conferences

SIEMENS VDO
Automotive

Environmental Product Management

Agenda:

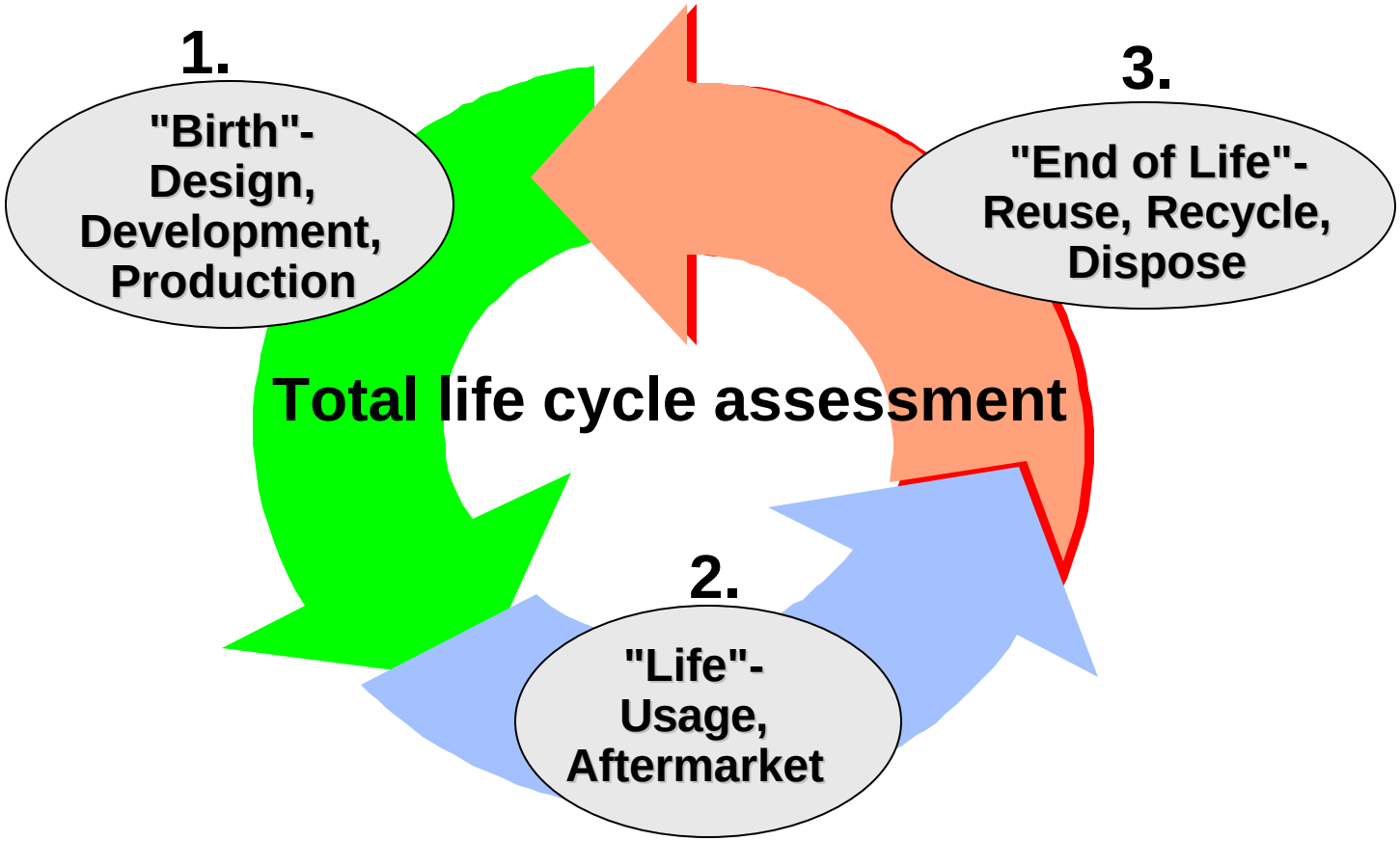
- Organization - Introduction - General
- Life Cycle of Products: Birth, Life, End-of-Life
- Restricted substances
- Customer requirements and reporting – IMDS
- End of Vehicle Life legislation

What can YOU do to design and promote environmentally compatible products?

SIEMENS VDO
Automotive

Environmental Product Management

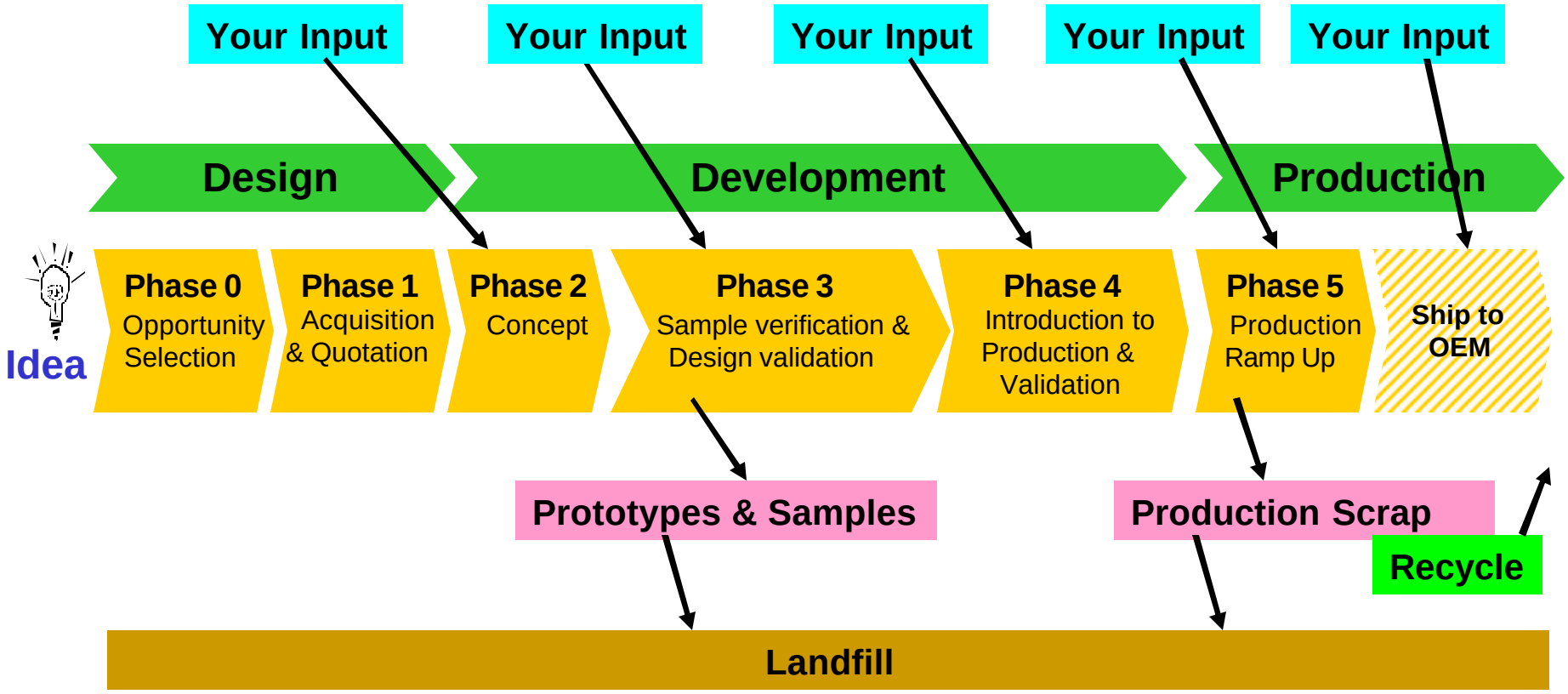
Life Cycle of Products



SIEMENS VDO
Automotive

Environmental Product Management

1. Internal Product Cycle: the Birth of a Product



SIEMENS VDO
Automotive

Environmental Product Management

Environmental Aspects in Design and Manufacturing:

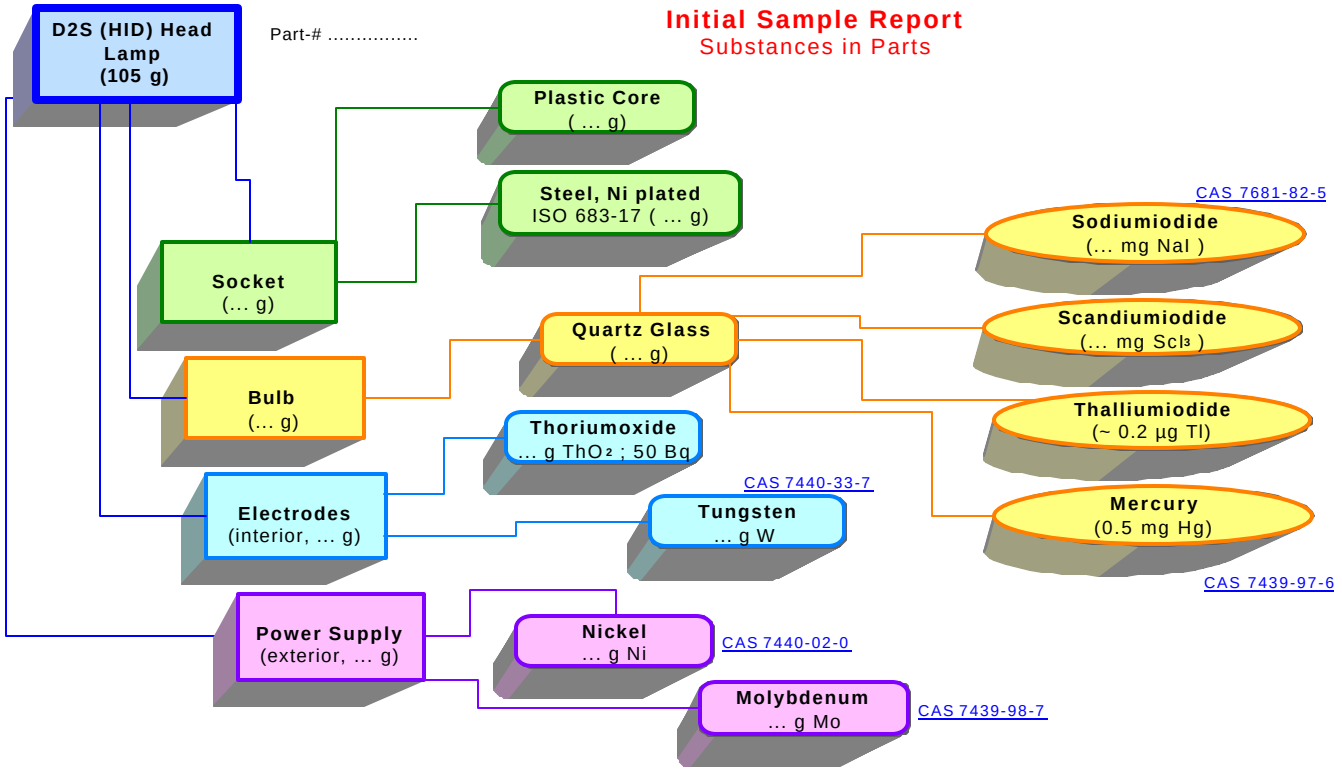
Your Inputs

- Evaluate product for cost, applicability, environmental effects
- Create a system to minimize and handle scrap
- Minimize use of hazardous materials during manufacture
- Establish Environmental Management System (ISO 14001) at factory
- Customer's documentation tool (IMDS) is required
- Design for ease of assembly
- Design for minimum number of components and types of materials
- Plan for easy separation of components and materials
- Design processes for Energy and Fuel savings

SIEMENS VDO
Automotive

Environmental Product Management

Initial Sample Report- Subassemblies and Components

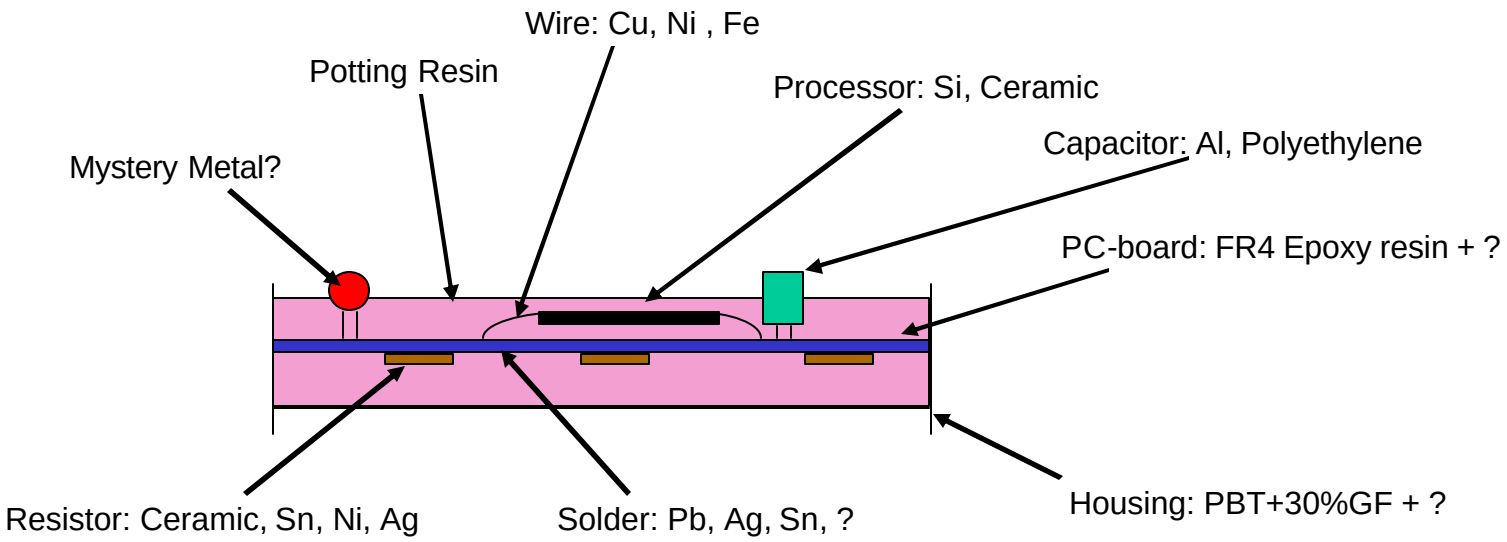


SIEMENS VDO
Automotive

Environmental Product Management

Restricted Substances? What materials?
How much weight, %, etc.?

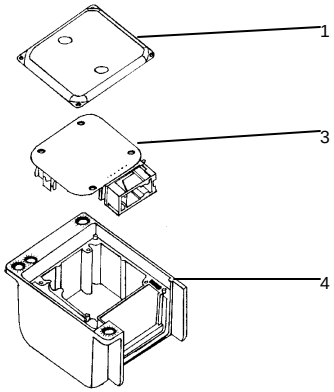
Every component, plus the assembly, must be documented



SIEMENS VDO
Automotive

Environmental Product Management

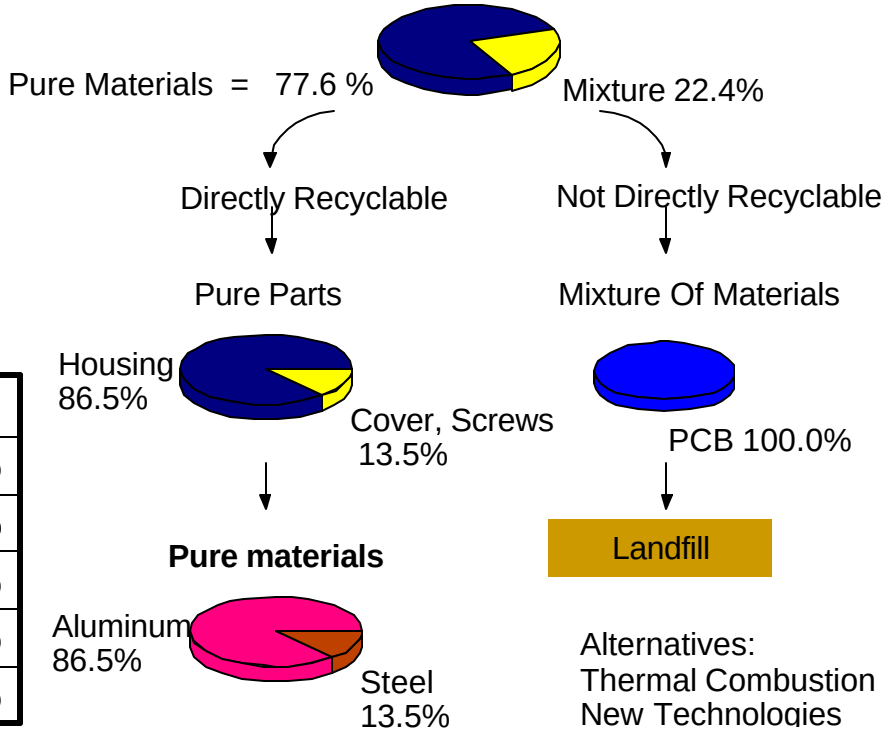
Material Data Sheet / Recycling Strategy



Exploded View

No.	Part	Material	Weight (g)	Weight %
1	Cover	ST 05 Z275 SB	32.38	10.41%
2	Screws	Steel	1.62	0.52%
3	Motherboard	Mixed	69.7	22.42%
4	Housing	Aluminum	207.2	66.77%
Total			310.9	100.00%

Airbag 4b- Balance Of Materials

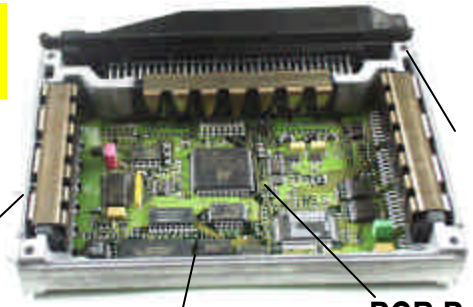


SIEMENS VDO
Automotive

Environmental Product Management

Redesign to reduce components, materials and weight:

Before



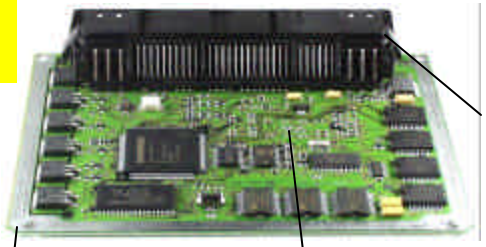
connector

Clamp for power component

Aluminum housing, two covers, 8 screws

PCB Process:
- SMD placement
- reflow soldering
- placement by hand
- wave soldering

After



connector

Aluminum housing, one cover, 4 screws

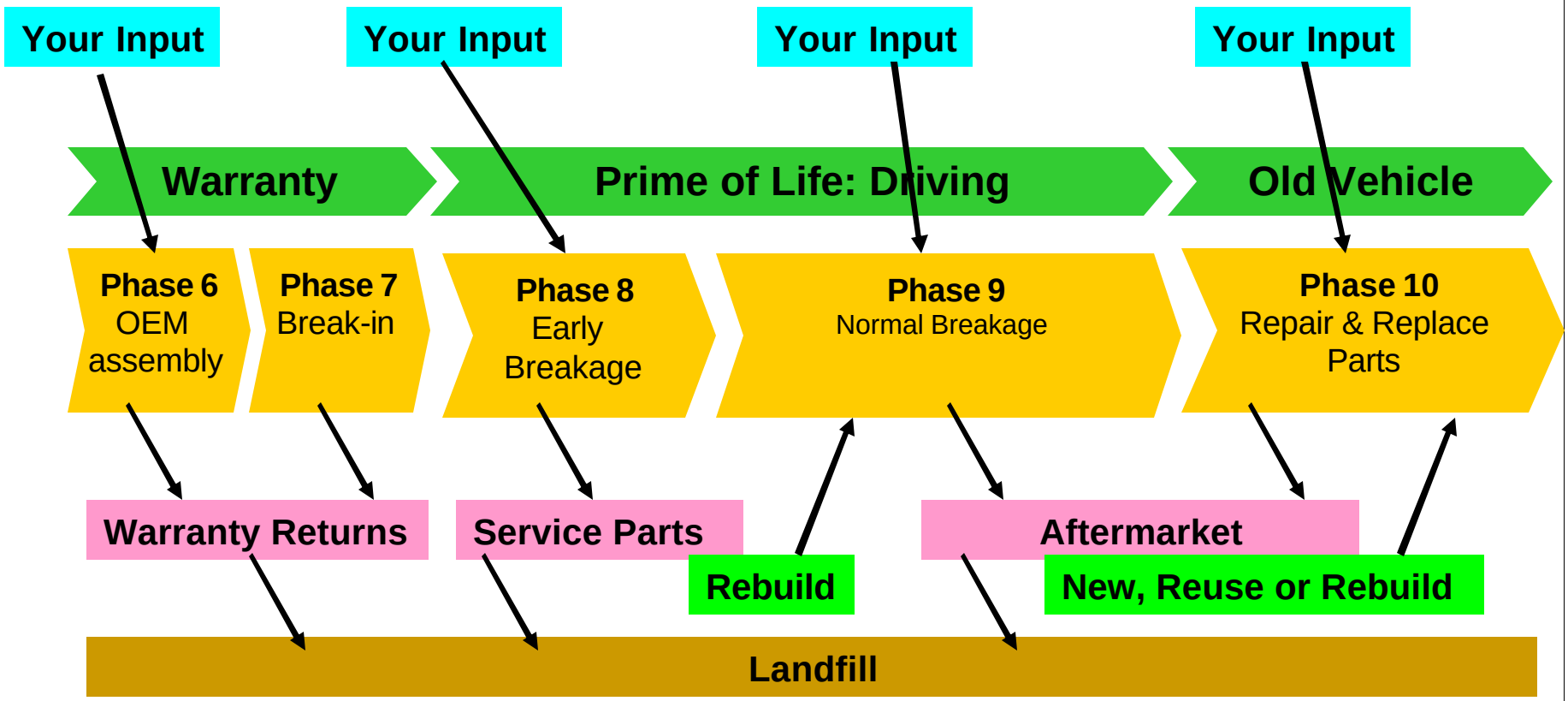
PCB Process:
- SMD placement for all components
- double-sided reflow soldering
- symmetric panel

Decrease by Redesign:	**Old Design**	**New Design**
• Weight	600 g	350 g
• Number of different Materials	8 kinds	4 kinds
• Amount Solder / Lead	11,1 g / 4,1 g	9,5 g / 3,5 g
• Use of PC-board area	90 %	100 %

SIEMENS VDO
Automotive

Environmental Product Management

2. External Product Cycle: the Useful Life of a Product



SIEMENS VDO
Automotive

Environmental Product Management

Environmental Aspects during use of the products:

Your Inputs

- Re-Evaluate material for cost, applicability, environmental effects
- Use the Internet Documentation Tool (IMDS): Reports to customers
- Create a system to receive, handle and dispose of
  Warranty Returns and contaminated products
- Possible redesign to reduce components and types of materials
- Document Energy and Fuel savings of the Product

SIEMENS VDO
Automotive

Environmental Product Management

What is IMDS (International Material Data System)?

- Customer database of all materials in vehicles
- One common standard for all participating OEMs
- Each new Product must have a Material Data Sheet
- Internet based tutorial, instructions and reporting
- Alerts OEMs of any restricted or prohibited materials
- Informs OEMs of recycled content and recyclability
- Prepares for future ELV initiatives and regulations
- Prepares for future supply chain integration

All new products in customer vehicles must be registered with IMDS!

SIEMENS VDO
Automotive

Environmental Product Management

Data collection for IMDS:

- Vehicle data: type, model year
- Product data: part number, plant, quantity
- Material data: subassembly and components, elements and compounds, restricted/prohibited substances
- Weight and weight-% of each element or compound
- Recycling data: per cent recycled content

To Register products in IMDS:
Contact your Division Coordinator!

SIEMENS VDO
Automotive

Environmental Product Management

Individual Customer Requirements for Environmentally Compatible Products:

VW:	Umweltnorm Fahrzeuge	VW 911 03
	Fahrzeug-Zulieferteile allgemein	VW 011 5
BMW:	Recycling of motor vehicles	
	Recycling-optimized vehicle desi	
	BMW 113 89.0T1-T3	
Ford:	Substance Use	WSS-M99P9999-A1
	Restricted	agement/Recycling
GM:	ication General	GMW 3059
	g Design Guide	GM 502 M
	lastic Parts Specification	GM 7400 M
Siemens:	Environmentally compatible products	SN 36350

Lists of declarable materials in automobile manufacturing
- Substances in components and construction materials (previous V
DA-List 232 -101)

SIEMENS VDO
Automotive

Environmental Product Management

Non-Automotive Environmentally Compatible Products:

Siemens Standard
SN 36350-1

Principles and Guidelines
"What should be done?"

Siemens Standard
SN 36350-

-2 Hazardous Substances
-3 Polymers recycling
-4 Metals recycling
-5 Packaging requirements
-6 Recording Product Substances
-7 Environmental declaration

Guide and Information

Solutions and Examples
"How can it be done?"

Product Assessment

Check list
"What has been achieved?"

Note: for our products, IMDS and Customer Requirements take precedence over SN 36350

SIEMENS VDO
Automotive

Environmental Product Management

Receiving and handling prototypes and warranty returns:

Fuel Rails

Fuel-contaminated Products

Fuel Injectors

Hydraulic Regulators

Fuel Pumps

SIEMENS VDO
Automotive

Environmental Product Management

Disposal of scrapped products, prototypes, and warranty returns:

- Consider the legal liabilities of misused products
- Consider how someone can misuse the product
- Consider the end-of-life safety and environmental aspects
- Consider what chemicals are used
- Used Products may be contaminated with hazardous materials (fuels, oil, chemicals, etc.)
- Beware shipping, receiving, or storing contaminated products

Contact your local environmental manager for disposal of prototypes and returned or contaminated products!

SIEMENS VDO
Automotive

Environmental Product Management

Consider how scrapped products can cause problems:

ECUs

Instrument Clusters

Fans

Make sure scrapped Products are unlabeled and destroyed!

SIEMENS VDO
Automotive

Environmental Product Management

Disposing Products:

- Clean all hazardous materials from products.
- All products, whether defective or not, must be destroyed when they are disposed.
- Remove or obliterate all labels and markings.
- Physically cut, smash, or otherwise render disposed products to be obviously unusable for any purpose.

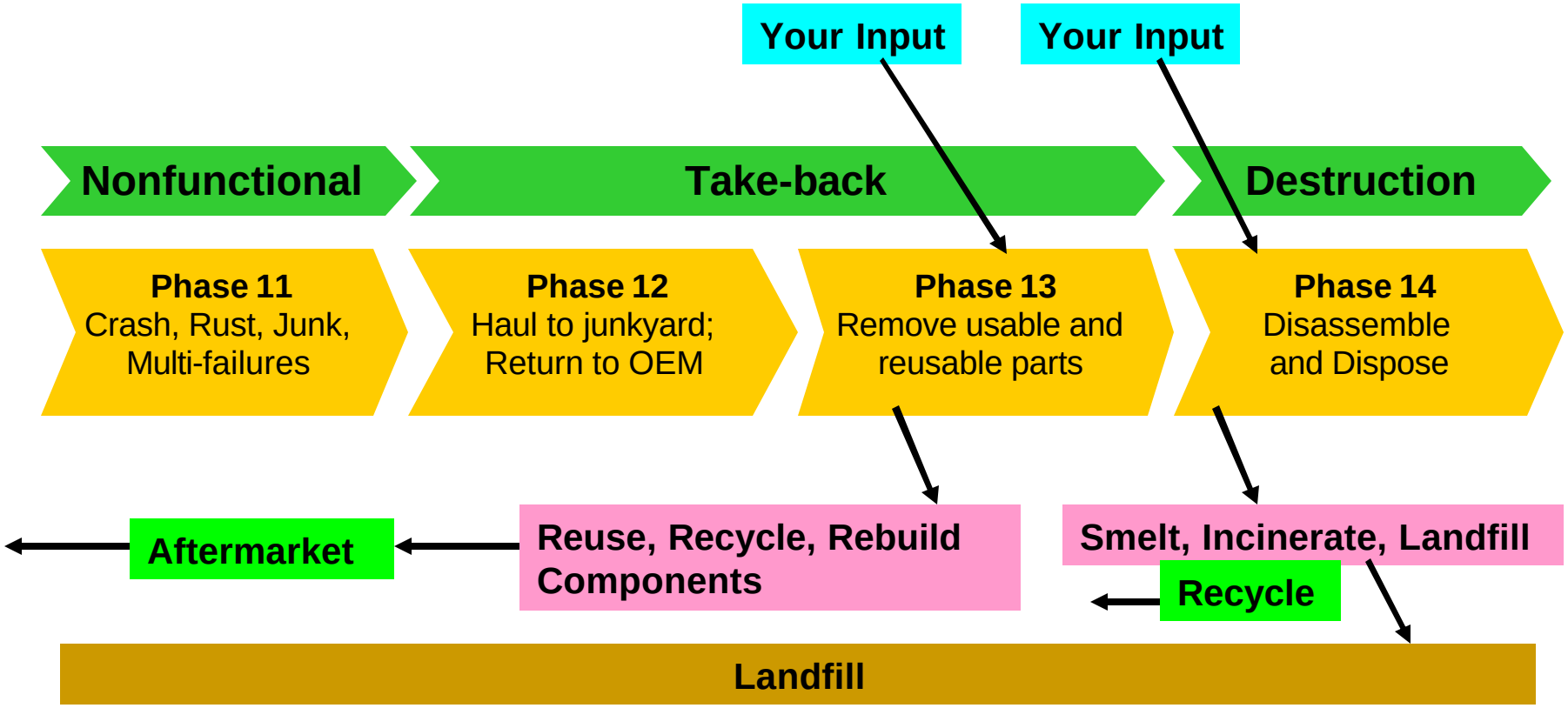
There is great potential liability for improperly disposed products!

Destroying PC Boards >>

SIEMENS VDO
Automotive

Environmental Product Management

3. End Product Cycle: End-of-Life of a Vehicle (ELV)



SIEMENS VDO
Automotive

Environmental Product Management

Environmental Aspects at End-of-Life:

Your Inputs

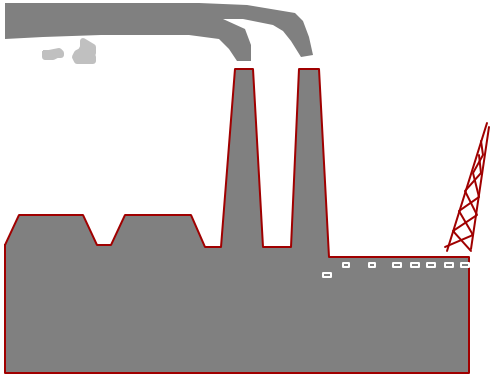
- Evaluate used products for reuse, rebuild, or recycling
- Document hazardous materials disposed
- Create a system to receive, handle and dispose of returned contaminated products
- Document easy separation of components and materials
- Determine fuel savings from lifetime use of the Product

SIEMENS VDO
Automotive

Environmental Product Management

End of Vehicle Life (ELV)

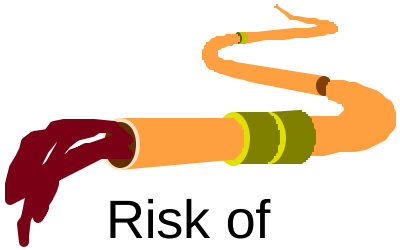
Scrapped cars
2 million/yr
in Germany
(10 million in EU)



1/2 million tons of
shredder waste

Content:
Oils, Fuels, Coolants
Heavy metals
Glass, Plastics, Hoses, Fluff

Expensive
disposal



Risk of
pollution

SIEMENS VDO
Automotive

Environmental Product Management

Scope of EU Legislation for ELV:

- Minimizing the impact of end-of-life vehicles on the environment
- Improving Design of Vehicles for recycling and recovery
- Quantified, documented targets for reuse, recycling and recovery
- Regulations and infrastructure for collection and recovery
- Last owner can deliver end-of-life vehicle for disposal at no cost

SIEMENS VDO
Automotive

Environmental Product Management

Main Issues of ELV:

- Disposal of scrap vehicles, components and parts, considering air emissions and noise control
- Restricted use of lead, mercury, cadmium and hexavalent chromium except in certain applications
- Increase Recycling Quota for plastics over time: 85% ? 95%
- Requirements for dismantling, re-use and recycling of products should be integrated in the design and production of new vehicles

SIEMENS VDO
Automotive

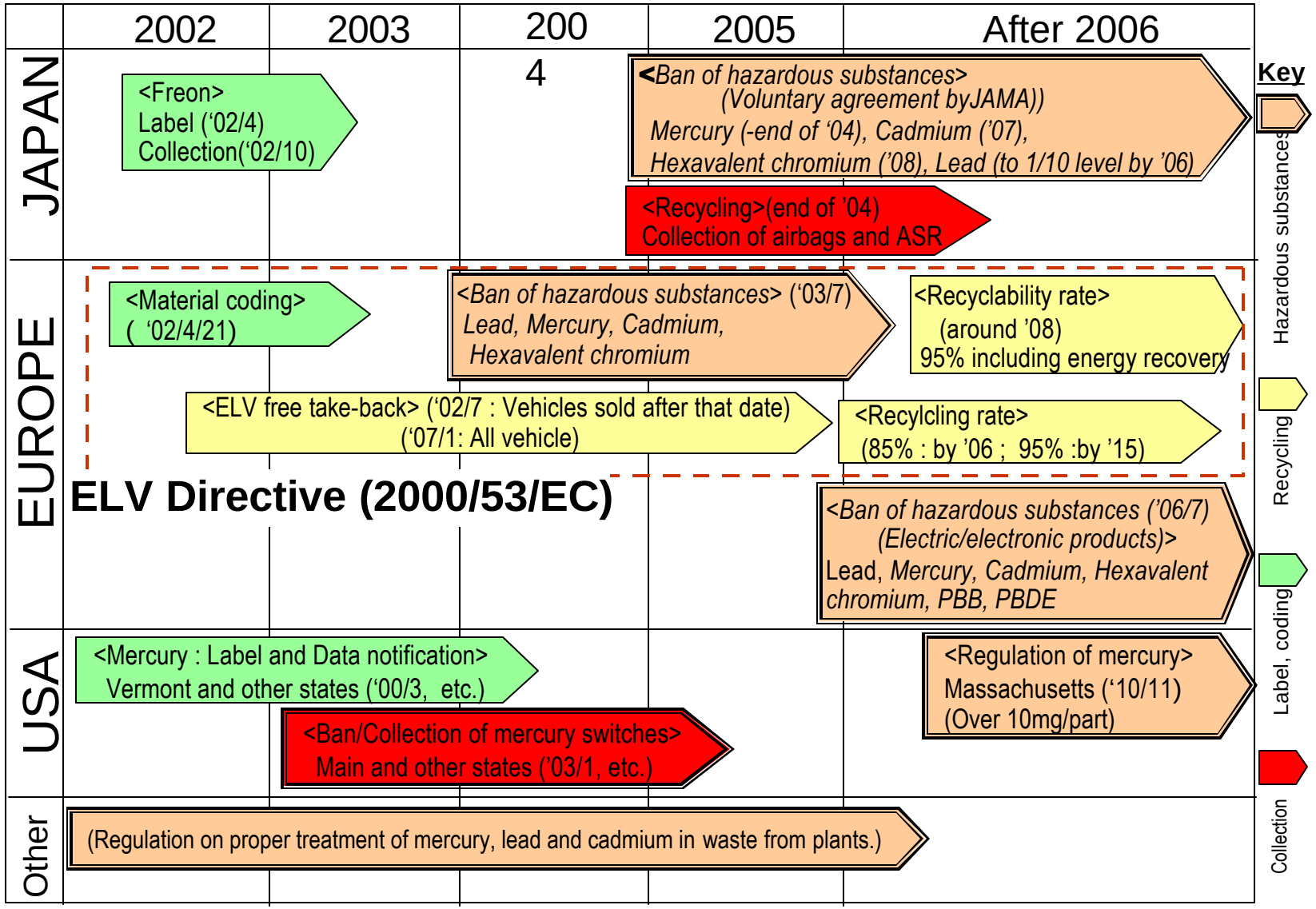
Environmental Product Management

ELV Annex II : List of Exemptions:

(These elements are allowed in vehicles)

- Lead as an alloying element = Pb
  (for machining purpose up to 2% by weight, e.g. Leaded Steel)
- Lead and lead compounds in components = Pb
  (Solder in electronic circuit boards and other electronic applications)
- Hexavalent Chromium = Cr^{+6}
  (Corrosion-preventive coatings)
- Cadmium = Cd
  (Thick film pastes)

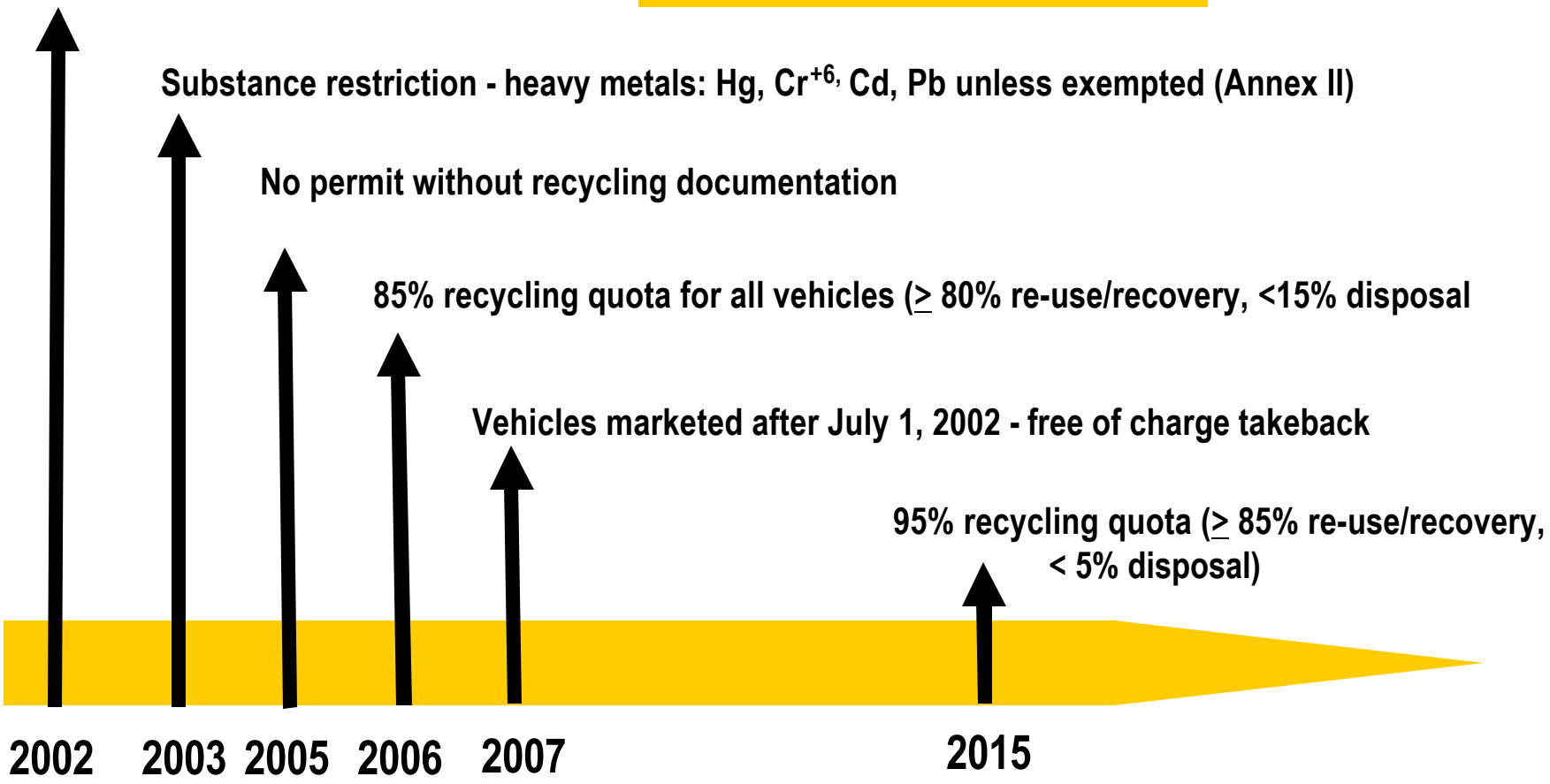
Regulations: Environmental / Recycling Hazardous Substances



SIEMENS VDO
Automotive

Environmental Product Management

Time Line for ELV

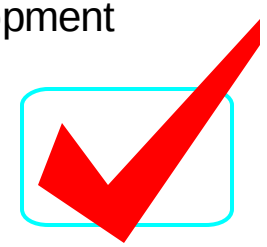


SIEMENS VDO
Automotive

Environmental Product Management

Summary of key points:

1. **Be aware of EU and Customer Requirements:**
   - Each Siemens Division is responsible for its own Product Development
   - Restricted use of Hg/Cd/Cr^{+6}/Pb
   - Reduce weight, complexity and cost
   - Handling and disposing scrapped/contaminated products
   - ELV initiative



2. **Use the Tools:**
   - Refer to Customer Specifications and drawings
   - Register new products with IMDS
   - Refer to SN 36350 for nonautomotive applications

3. **Compare Expenses and Benefits!**

Gives an Advantage in the marketplace!

SIEMENS VDO
Automotive

Environmental Product Management

QUESTIONS?